

Comment Form for 1st Draft of Standard PRC-023-1 — Transmission Relay Loadability

This form must be used to submit comments on the proposed Relay Loadability standard. Comments must be submitted by **September 29, 2006**. You must submit the completed form by e-mail to sarcomm@nerc.com with the words "Relay Loadability Comments" in the subject line. If you have questions please contact Richard Schneider at richard.schneider@nerc.net or 609-452-8060.

Individual Commenter Information		
(Complete this page for comments from one organization or individual.)		
Name:		
Organization:		
Telephone:		
E-mail:		
NERC Region	<input type="checkbox"/>	Registered Ballot Body Segment
<input type="checkbox"/> ERCOT	<input type="checkbox"/>	1 — Transmission Owners
<input type="checkbox"/> ECAR	<input type="checkbox"/>	2 — RTOs, ISOs, Regional Reliability Councils
<input type="checkbox"/> FRCC	<input type="checkbox"/>	3 — Load-serving Entities
<input type="checkbox"/> MAAC	<input type="checkbox"/>	4 — Transmission-dependent Utilities
<input type="checkbox"/> MAIN	<input type="checkbox"/>	5 — Electric Generators
<input type="checkbox"/> MRO	<input type="checkbox"/>	6 — Electricity Brokers, Aggregators, and Marketers
<input type="checkbox"/> NPCC	<input type="checkbox"/>	7 — Large Electricity End Users
<input type="checkbox"/> SERC	<input type="checkbox"/>	8 — Small Electricity End Users
<input type="checkbox"/> SPP	<input type="checkbox"/>	9 — Federal, State, Provincial Regulatory, or other Government Entities
<input type="checkbox"/> WECC		
<input type="checkbox"/> NA — Not Applicable		

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Group Comments (Complete this page if comments are from a group.)

Group Name: **Midwest Reliability Organization**
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Terry Bilke	MISO	MRO	2
Ken Goldsmith	ALT	MRO	2
Carol Gerou	MP	MRO	2
Todd Gosnell	OPPD	MRO	2
Wayne Guttormson	SPC	MRO	2
Jim Maenner	WPS	MRO	2
Tom Mielnik	MEC	MRO	2
Darrick Moe Chair	WAPA	MRO	2
Pam Oreschnick	XEL	MRO	2
Dick Pursley	GRE	MRO	2
Dave Rudolph	BEPC	MRO	2
Eric Ruskamp	LES	MRO	2
Joe Knight, Secretary	MRO	MRO	2
		MRO	2

* If more than one Region or Segment applies, indicate the best fit for the purpose of these comments. Regional acronyms and segment numbers are shown on prior page.

Background Information:

Protective relays have often contributed to system disturbances including the Northeast Blackout of 1965, and the Blackout of August 14, 2003. The 2003 blackout analyses showed that relay loadability played a pivotal role in accelerating and spreading the early part of the cascade in Ohio and Michigan. Although the U.S.-Canada Power System Outage Task Force focused on the role played by “zone 3” relays, it was later found that other phase-distance and over-current relays also contributed to the cascade.

The purpose of the proposed Standard is to ensure that protection systems and settings will neither limit transmission loadability, nor contribute to cascading outages.

NERC’s System Protection and Control Task Force produced a reference document to assist entities in understanding the standard. You are encouraged to read the reference document with the standard before responding to the comments on the Transmission Relay Loadability standard. If you have comments on the SPCTF’s Transmission Relay Loadability reference document, please e-mail those comments in a separate Word document to sarcomm@nerc.com with the words “Relay Loadability Comments” in the subject line.

Please Enter All Comments in Simple Text Format.

1. Do you feel that the requirements stated in this standard accurately address the industry action generally referred to as the “NERC Recommendation 8a Review” and the “Protection System Review Program – Beyond Zone 3”. Recommendation 8a called for all transmission owners to evaluate the zone 3 relay settings on all transmission lines operating at 230 kV and above for the purpose of verifying that each zone 3 relay is not set to trip on load under extreme emergency conditions. These activities included a review of all transmission protection systems relative to provided criteria and correction of those systems that did not conform to the criteria. The criteria established for those review activities are the genesis of this standard.

Yes

No

Comments The MRO generally believes this standard addresses the industry action listed above but has some significant reservations about how the standard is written as well as concerns about potential risks to reliability if this standard is implemented. (1) This standard should be more directly based on the concept that collapse should be slowed or delayed to the extent of the thermal capability of facilities. Suggest the purpose statement read - Protective relay settings shall not limit transmission loadability uncontrolled collapse is slowed or delayed to the extent of the thermal capability of facilities. The proposed standard should make direct reference to the additional time this standard is targeting to give the operators to respond to an emergency situation. In the current draft there is a rather indirect reference to 15 minutes. (2) The MRO is concerned that this standard is removing some inherent thermal overload protection from the bulk electric system. In its response to comments the SAR drafting team stated - The emergency loadability of equipment should be reflected in the equipment ratings, and the fault protective relay should not be responsible for relieving emergency loading concerns. Controlling of emergency load should be left to system operators. - The fact is that fault protection also provides (admittedly crude) overload protection and MRO believes there is increased inherent risk to the bulk electric system in the sentiment of the Sar drafting team's second statement. In NERC Recommendation 8a it is stated - It is not practical to expect operators will always be able to analyze a massive, complex system failure and to take the appropriate corrective actions in a matter of a few minutes. - and yet this is what this standard is expecting. Something like 400 transmission circuits tripped during August 14 blackout with no significant thermal overload damage. If the requirements of this standard had been met prior to August 14, 2003, would equipment damage have further delayed restoration? The MRO believes that a risk analysis should be conducted before implementing this standard. (3) The MRO believes this draft of the standard is too prescriptive. The equipment owner should be deciding the appropriate level of risk with regard to thermal overload and loss of life. The SDT should not decide the level of risk for the transmission owners. The standard is a good guide but too prescriptive. (4) The SAR designates that this standard shall also be applicable to the Regional Reliability Organization. In its response to comments the SAR drafting team stated - It is anticipated that the RRO will be responsible for compliance to NERC for developing a methodology for identifying its operationally significant circuits and for identification of those operationally significant circuits. The SAR was modified to include these clarifications. - However, there are no requirements on the RRO in this standard. Specifically, where in the standards is the RRO required to identify lines/transformers critical to the reliability of the electric system? If it is even appropriate for the RRO to come up with the methodology, the

needed requirements on the RRO should include a requirement to develop the methodology in coordination with the RC, PA and the TO. (5) In 4.1.2 and 4.1.4, the words "as designated by the Regional Reliability Organization as critical to the reliability of the electric system" are not consistent with those used in the SAR (operationally significant circuits, etc.). (6) if during the largest blackout in US history, the existing system, group of standards, and relay set points separated the system in time to prevent significant equipment damage so that the system could be restored virtually without incident; then implications of changing relay setting philosophy should be studied carefully. For example, what is the time overload characteristic of wavetraps compared to line conductors? How will system operators know when equipment damage is imminent in order to take that equipment out of service on time?

2. Do you believe the Transmission Relay Loadability Standard Reference Document should be incorporated as an 'Attachment' to the standard and made mandatory **or** provided as a 'Voluntary Reference' outside the standard to support implementing the standard?

Explain why.

- Reference should be made a mandatory part of the standard
- Reference should be made available as a voluntary reference without mandatory compliance

Explanation for selection:

- (1) In its response to comments the Sar drafting team stated that

- the resulting standard to be developed will develop loadability requirements, not methods to satisfy the requirements -. The MRO agrees with this approach of the SAR drafting team. The reference document should not be made part of the standard because the how should be left up to the owner of the protection system. Also, a reference document will not be able to keep up to date with changing relay technology. The MRO recognizes the value of the reference document as a guide and the hard work that went into preparing it. (2) The reference document (Determination and Application of Practical Relaying Loadability Ratings, Version 1.0, August 14, 2006) states generator protection relays are excluded from requirements of this PRC-023-1 standard (Page 1, section 2.3, reference document). The attachment A (section 1.2.4) to standard PRC-023-1 states generator protection relays that are susceptible to load are excluded from requirements of this PRC-023-1 standard. Should the attachment A of the standard be consistent with the reference document for the standard? (3) The reference document (Determination and Application of Practical Relaying Loadability Ratings, Version 1.0, August 14, 2006) states on page 9 states 200% of aggregated generation nameplate capability when the standard lists 230% of aggregated generated nameplate capability. (section R1.6) Why is the standard 230% when its reference document uses 200%? (4) The reference document (Determination and Application of Practical Relaying Loadability Ratings, Version 1.0, August 14, 2006) states on page 14 "If an overcurrent relay is supervised by either a top oil or simulated winding hot spot element less than 100°C and 140 C respectively, justification for the reduced temperature must be provided." Where as in the standard (section R.11, last part), the standard states "Install supervision for the relays using either a top oil or simulated winding hot spot temperature element. The setting should be no less than 100 C for the top oil or 140°C for the winding hot stop temperature."

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Shouldn't the reference document be consistent with the standard? (Where anything less than 100°C and 140 °C would have justification associated with it.)

3. Are you aware of any regional differences that would be required as a result of this standard?

- Yes
 No

If yes, please identify the regional difference.

4. Are you aware of any conflicts between the proposed standard and any regulatory function, rule order, tariff, rate schedule, legislative requirement or agreement?

- Yes
 No

If yes, please identify the conflict, being as specific as possible. However, there could be regulatory issues regarding, for example, vertical clearance issues, for the proposed overloading of lines.

5. Do you agree with the proposed effective dates?

- Yes
 No

If no, please identify which effective date should be modified and identify why.

(1)The effective dates for lines operated at 100kV to 200 kV and transformers, as designated by the regional reliability organization as critical to the reliability of the electric system in the region should be one year after the regional reliability organization has made this designation. It would seem reasonable that owners should not be expected to even start review of the 100kV OS circuits until the Region has defined the specific circuits. A date that the RRO's are required to make this designation should be recommended by the SDT and added to the implementation plan. (2) Regarding implementation plan, one would have expected an implementation time frame of the stated durations strictly for identifying initial areas of non-compliance, and defining a plan to become compliant, with subsequent dates provided for becoming fully compliant. Eleven months after establishment of the standard is not a reasonable time frame for implementing all setting changes, and certainly not for design changes if required. It would appear that NERC are depending on all participants to have proceeded with reviews and actions as indicated in the initial zone 3 exercise. Perhaps regions/owners had every right to not proceed until the proposed standard is in force. Perhaps many of the efforts have proceeded, but should the proposed standard require that they all did?

6. Do you agree with the proposed violation risk factors?

- Yes
 No

If no, please identify which requirement's risk factors you disagree with and identify what you think the risk factor should be and why. TThe MRO feels that the more appropriate violation risk factor is medium because implementing this standard will not prevent the initiation of a blackout event.

7. If you have other comments or specific suggestions for improvements to this standard that you have not already made, please provide them here:

(1) The MRO has a concern with the 15% additional margin applied to the facility rating. This can be considered a negative margin wrt protecting against thermal overload. The SAR indicates that protection should not unnecessarily limit the loadability of the system, it does not state that protection should be sacrificed or removed. This approach is outside the intention of the SAR. Again it should be up to the equipment owner to assess the appropriate overloading philosophy.

(2) Does this standard expose the TO etc. to legal risk if there is damage to the public (violating virtual clearances for example) (3) If we are relying on the operator to prevent overloads, are the associated metering, communication, and human machine interface systems (not to mention the human involvement) designed and maintained with equivalent reliability to the protection system? Also, the SCADA system may be down therefore the operator may not be able to assume the role of preventing equipment damage. (4) There should be a classification that allows the transmission owners with stability limited lines to perform studies which allow relay settings to identify the conditions the relay will actual see under extreme conditions. The .85 pu voltage, and power factor angle of 30 degrees. criteria may not be appropriate for all cases.(5) If you have too prescriptive a standard you may discourage people coming up with adaptive solutions. (6) This standard removes the option of using zone three relays to provide more reliable system operation

(a) For internal lines – it may not be possible to set an out of step relay to block tripping on a true out of step condition. (Moving blinders in may make it impossible to detect fast moving swings)(b) On interties: It may not be possible to set relays to detect fastest swing to be able to trip the tie – as a consequence, undesired tripping of other lines may occur. (7) This standard seems to be precluding the concept of TO's etc. applying to use other settings than prescribed by this standard as was the case with zone 3 issue. A TO should be allowed to use relay settings other than based on the the prescribed criteria if it can be demonstrated there is no benefit to applying the prescribed criteria in a given situation but there is, in fact, a negative impact on the TO's system. (8) R2.1 and R2.2 could be combined by adding 1.12 to the list in R2.1 and removing R2.2 (9) In M1 and M2 it should be further clarified what is meant by "evidence". (11) In R2, why would it be necessary to get approval of the RRO and RC? If each criteria choice is valid, why is this necessary? This is unnecessary bureaucracy. (10) Is the interpretation of R1 that the TO etc. could more that one criteria within their system? (11) In Appendix A what is meant by: 1.2.3 Protection systems intended for protection during stable power swings?